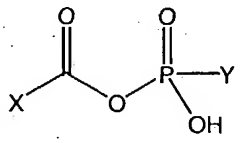
WHAT IS CLAIMED IS:

1. A β-lactamase inhibitor of Formula *I*:



(*I*)

or a salt thereof;

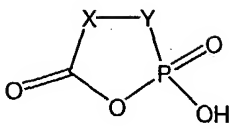
wherein X is alkyl, aryl, aralkyl, or heterocyclic radical; Y is Z or OZ; and Z is alkyl, aryl, aralkyl, acyl, heterocyclic radical, or phosphonyl; provided, however, that when Y is Z, then Z is not phosphonyl; and further provided that when Y is OZ and Z is phenyl, then X is not methyl or phenyl; when Y is OZ and Z is alkyl or adenosyl, then X is not α-aminoalkyl; and when Y is OZ and Z is benzoyl, then X is not phenyl.

2. The inhibitor according to claim 1, wherein Y is Z, where Z is selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, $(C_{6-10})ar(C_{1-6})alkyl$, acyl, heteroaryl, fused heteroaryl, and phosphonyl.

3. The inhibitor according to claim 2, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, any of which groups may be optionally substituted.

4. The inhibitor according to claim 3, Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, wherein the phenyl or naphthyl is unsubstituted or is substituted with one or two substituents independently selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{6-10} aryl, and nitro.

5. A β-lactamase inhibitor of Formula *II*:



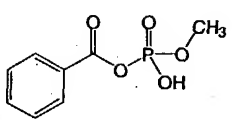
(*II*)

wherein Y is O or alkylene, and X is alkylene, cycloalkylene, fused heterocycle, heteroarylene, or arylene, wherein the alkylene, cycloalkylene, fused heterocycle, heteroarylene, and arylene groups may be optionally substituted; provided that X is not phenylethene.

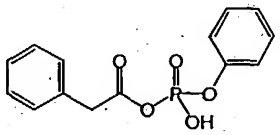
6. The inhibitor according to claim 5, wherein X is a fused carbocyclic, heterocyclic, aromatic, or heteroaromatic ring.

7. The inhibitor according to claim 6, wherein X is phenylene.

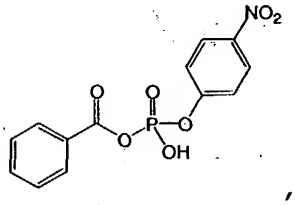
8. A β-lactamase inhibitor selected from the group consisting of:



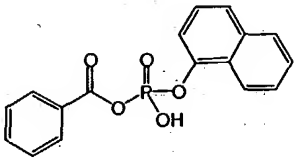
,



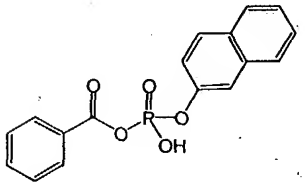
,



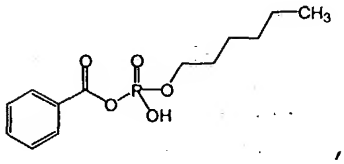
,



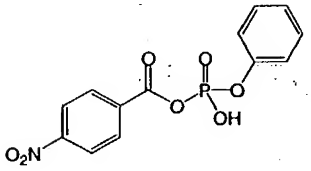
,



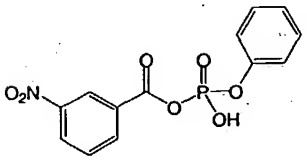
,



,

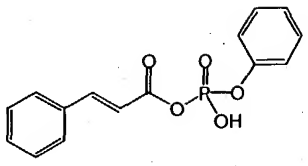
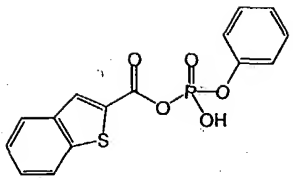
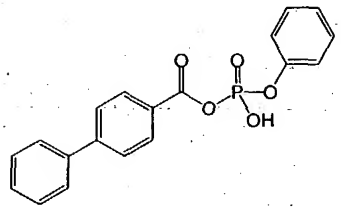
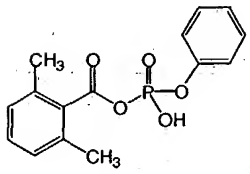
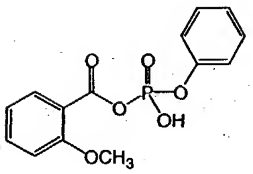
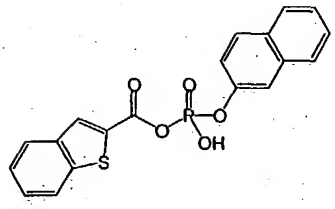


,

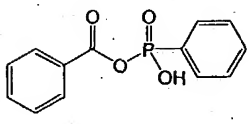
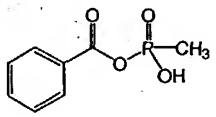
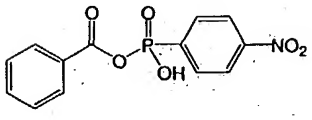
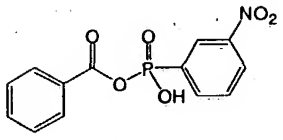
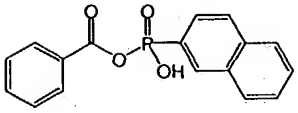
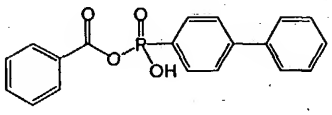
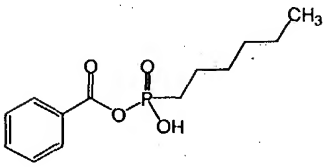


,

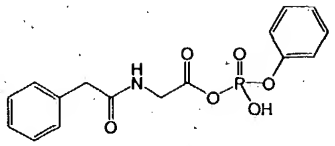
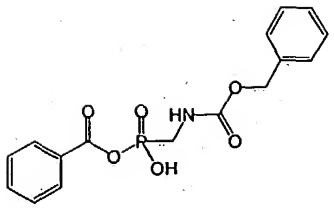
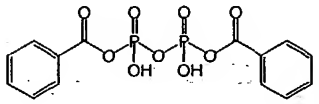
- 48 -


,

,

,

,

,

, and salts thereof.

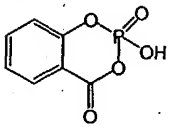
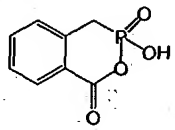
9. A β-lactamase inhibitor selected from the group consisting of:


,

,

,

,

,

,

, and salts thereof.

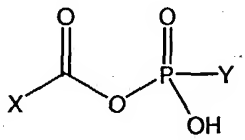
10. A β-lactamase inhibitor selected from the group consisting of:


,

,

, and salts thereof.

11. A β-lactamase inhibitor selected from the group consisting of:


,

, and salts thereof.

12. A pharmaceutical composition comprising a β-lactamase inhibitor of Formula *I*:


(*I*)

or a salt thereof;

wherein X is alkyl, aryl, aralkyl, or heterocyclic radical; Y is Z or OZ; and Z is alkyl, aryl, aralkyl, acyl, heterocyclic radical, or phosphonyl; provided, however, that when Y is Z, then Z is not phosphonyl; and

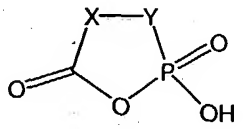
a pharmaceutically acceptable carrier, diluent, or excipient.

13. The composition according to claim 12, wherein Y is Z, where Z is selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, $(C_{6-10})ar(C_{1-6})alkyl$, acyl, heteroaryl, fused heteroaryl, and phosphonyl.

14. The composition according to claim 13, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, any of which groups may be optionally substituted.

15. The composition according to claim 14, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, wherein the phenyl or naphthyl is unsubstituted or is substituted with one or two substituents independently selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{6-10} aryl, and nitro.

16. A pharmaceutical composition, comprising a β-lactamase inhibitor of Formula *II*:



(*II*)

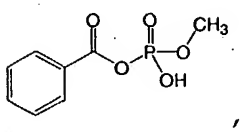
wherein Y is O or alkylene, and X is alkylene, cycloalkylene, fused heterocycle, heteroarylene, or arylene, wherein the alkylene, cycloalkylene, fused heterocycle, heteroarylene, and arylene groups may be optionally substituted; and

a pharmaceutically acceptable carrier, diluent, or excipient.

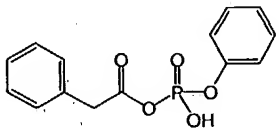
17. The composition according to claim 16, wherein X is a fused carbocyclic, heterocyclic, aromatic, or heteroaromatic ring.

18. The composition according to claim 17, wherein X is phenylene.

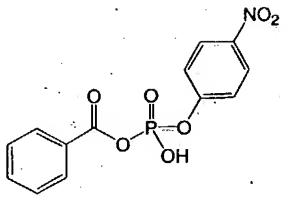
19. A pharmaceutical composition, comprising a β-lactamase inhibitor selected from the group consisting of:

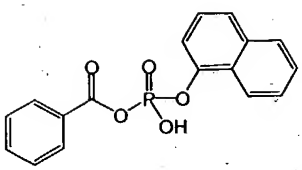


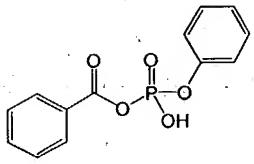
,

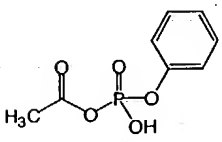


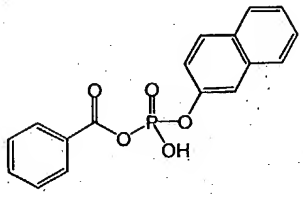
,

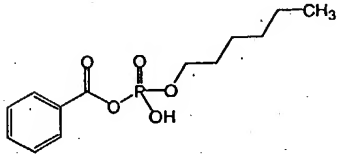

,

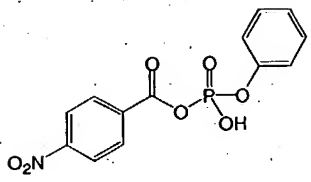

,

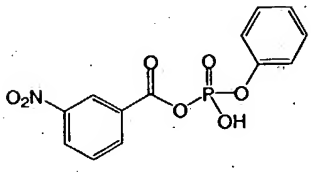

,

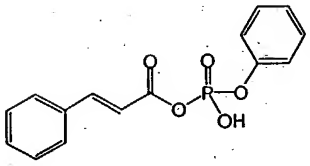

,

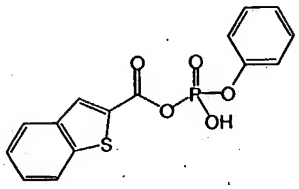

,

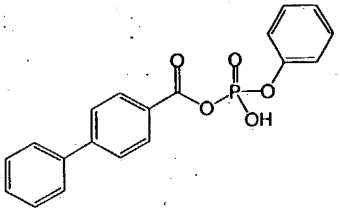

,

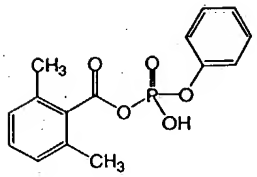

,

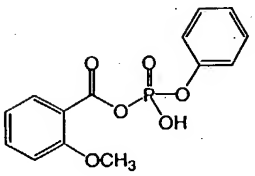

,

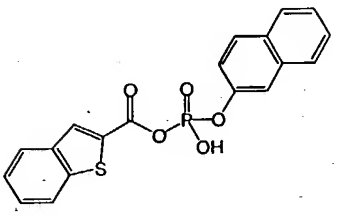

,


,


,

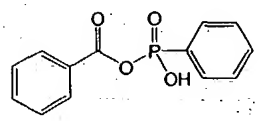
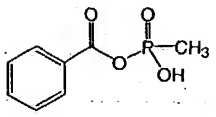
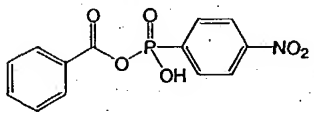
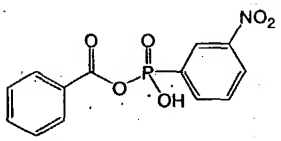
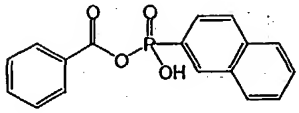
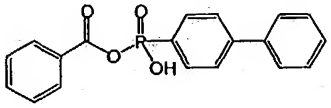
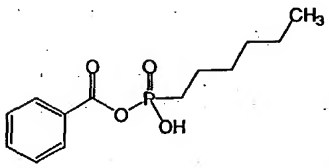

,


,


, and salts thereof; and

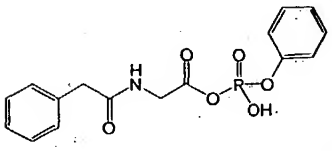
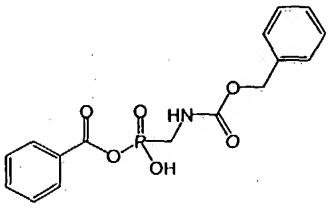
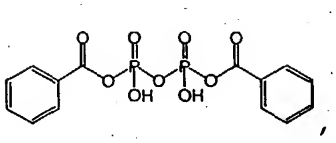
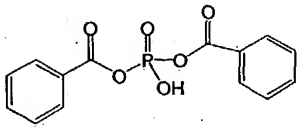
a pharmaceutically acceptable carrier, diluent, or excipient.

20. A pharmaceutical composition, comprising a β-lactamase inhibitor selected from the group consisting of:


,

,

,

,

,

,

, and salts thereof; and

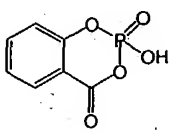
a pharmaceutically acceptable carrier, diluent, or excipient.

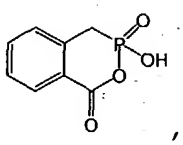
21. A pharmaceutical composition, comprising a β-lactamase inhibitor selected from the group consisting of:

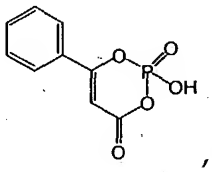

,

,

,

, and salts thereof; and

a pharmaceutically acceptable carrier, diluent, or excipient.

22. A pharmaceutical composition, comprising a β-lactamase inhibitor selected from the group consisting of:



,


,


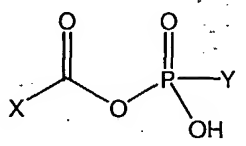
, and salts thereof; and

a pharmaceutically acceptable carrier, diluent, or excipient.

23. The composition according to any one of claims 12, 16, 19, 20, 21, or 22, further comprising an antibiotic agent.

24. The composition according to claim 23, wherein the antibiotic agent is a β-lactam antibiotic.

25. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor of Formula *I*:



(*I*)

or a salt thereof;

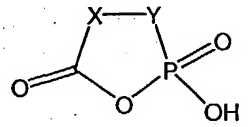
wherein X is alkyl, aryl, aralkyl, or heterocyclic radical; Y is Z or OZ; and Z is alkyl, aryl, aralkyl, acyl, heterocyclic radical, or phosphonyl; provided, however, that when Y is Z, then Z is not phosphonyl.

26. The method according to claim 25, wherein Y is Z, where Z is selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, (C_{6-10})ar(C_{1-6})alkyl, acyl, heteroaryl, fused heteroaryl, and phosphonyl.

27. The method according to claim 26, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, any of which groups may be optionally substituted.

28. The method according to claim 27, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, wherein the phenyl or naphthyl is unsubstituted or is substituted with one or two substituents independently selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{6-10} aryl, and nitro.

29. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor of Formula *II*:



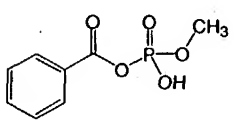
(*II*)

wherein Y is O or alkylene, and X is alkylene, cycloalkylene, fused heterocycle, heteroarylene, or arylene, wherein the alkylene, cycloalkylene, fused heterocycle, heteroarylene, and arylene groups may be optionally substituted.

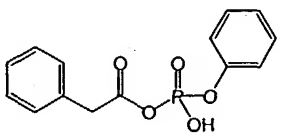
30. The method according to claim 29, wherein X is a fused carbocyclic, heterocyclic, aromatic, or heteroaromatic ring.

31. The method according to claim 30, wherein X is phenylene.

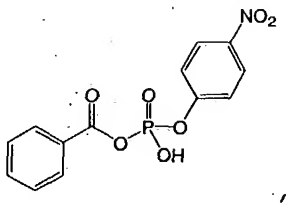
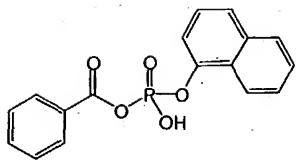
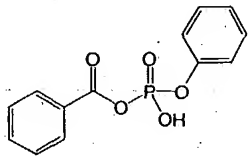
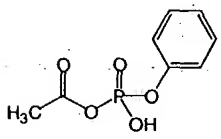
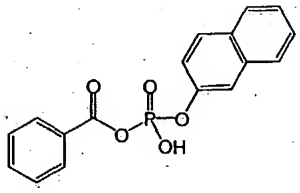
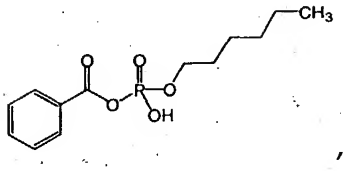
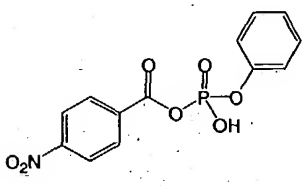
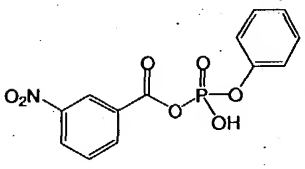
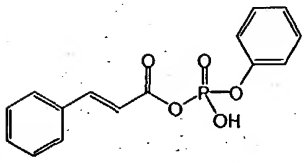
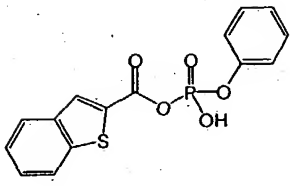
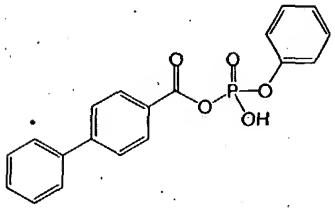
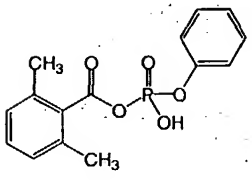
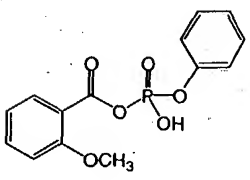
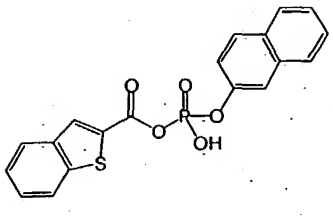
32. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor selected from the group consisting of:



,



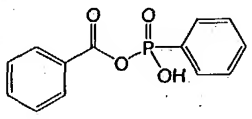
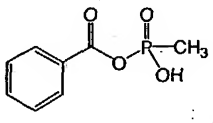
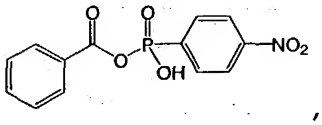
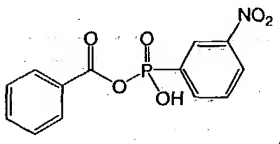
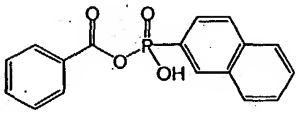
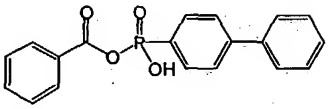
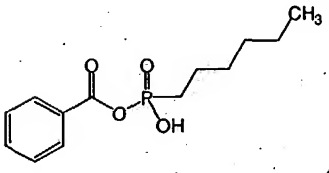
,

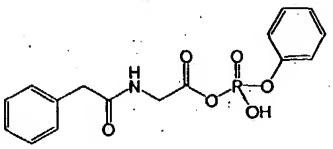
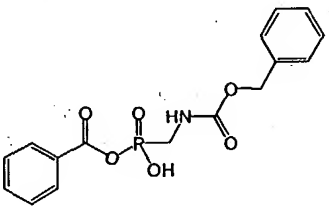
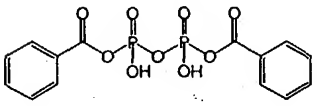
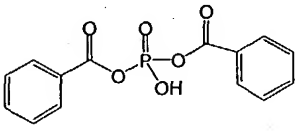
5

, and salts thereof.

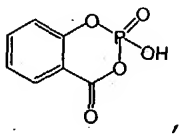
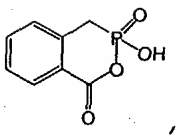
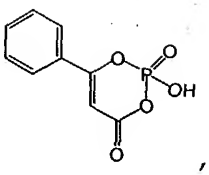
33. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor selected from the group consisting of:


,

,

,

,

,

,

, and salts thereof.

34. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor selected from the group consisting of:


,

,

,

, and salts thereof.

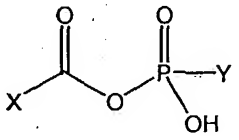
35. A method for inhibiting β-lactamase activity, comprising administering a β–lactamase inhibitor selected from the group consisting of:

 ,  ,  , and salts thereof.

36. The method according to any one of claims 25, 29, 32, 33, 34, or 35, further comprising an antibiotic agent.

37. The method according to claim 36, wherein the antibiotic agent is a β-lactam antibiotic.

38. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor of Formula *I*:

 (*I*)

or a salt thereof;

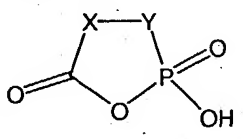
wherein X is alkyl, aryl, aralkyl, or heterocyclic radical; Y is Z or OZ; and Z is alkyl, aryl, aralkyl, acyl, heterocyclic radical, or phosphonyl; provided, however, that when Y is Z, then Z is not phosphonyl.

39. The method according to claim 38, wherein Y is Z, where Z is selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, $(C_{6-10})ar(C_{1-6})alkyl$, acyl, heteroaryl, fused heteroaryl, and phosphonyl.

40. The method according to claim 39, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, any of which groups may be optionally substituted.

41. The method according to claim 40, wherein Z is selected from the group consisting of C_{1-6} alkyl, phenyl, and naphthyl, wherein the phenyl or naphthyl is unsubstituted or is substituted with one or two substituents independently selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{6-10} aryl, and nitro.

42. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor of Formula *II*:



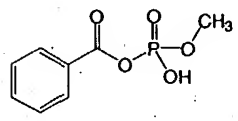
(*II*)

wherein Y is O or alkylene, and X is alkylene, cycloalkylene, fused heterocycle, heteroarylene, or arylene, wherein the alkylene, cycloalkylene, fused heterocycle, heteroarylene, and arylene groups may be optionally substituted.

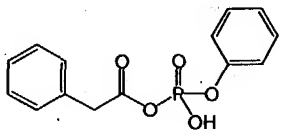
43. The method according to claim 42, wherein X is a fused carbocyclic, heterocyclic, aromatic, or heteroaromatic ring.

44. The method according to claim 43, wherein X is phenylene.

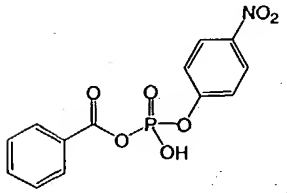
45. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor selected from the group consisting of:



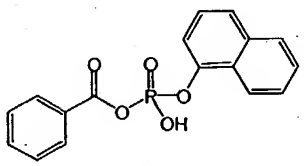
,



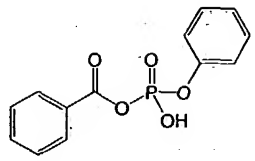
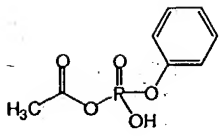
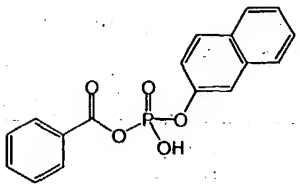
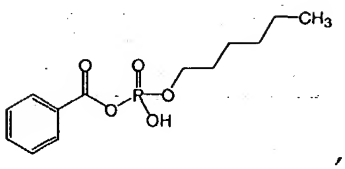
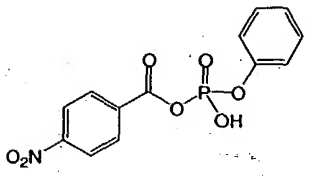
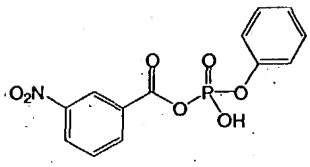
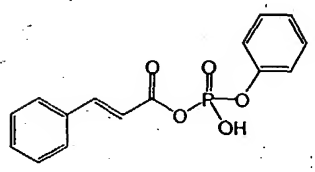
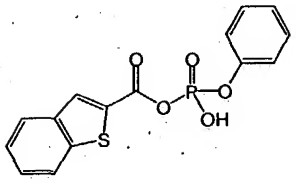
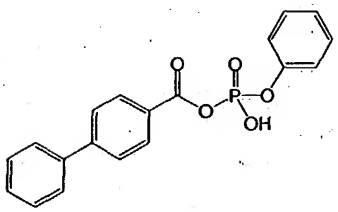
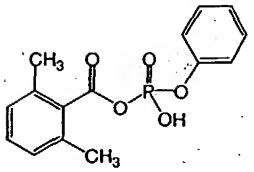
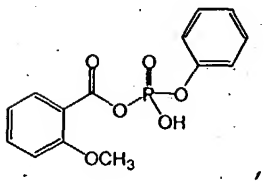
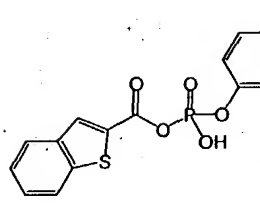
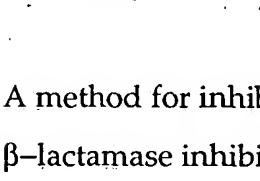
,



,

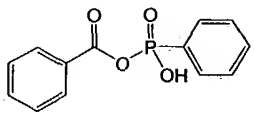
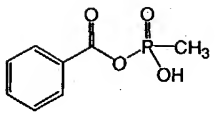
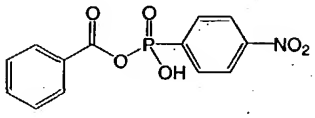
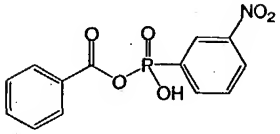
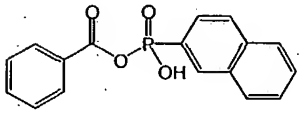
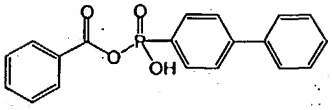
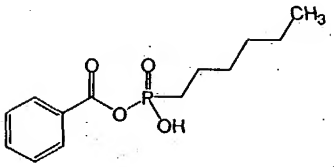


,

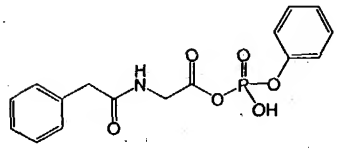
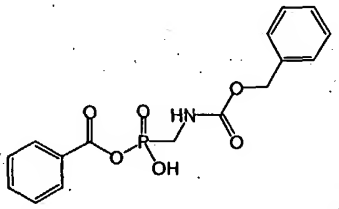
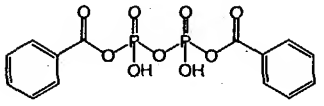
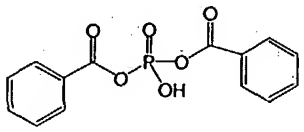

,

,

,

,

,

,

,

,

,

,

,

,

,

, and salts thereof.

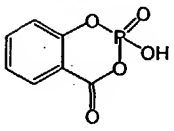
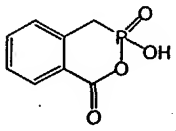
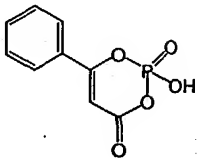
46. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor selected from the group consisting of:


,

,

,

,

,

,

, and salts thereof.

47. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor selected from the group consisting of:


,

,

,

, and salts thereof.

48. A method for inhibiting bacterial growth, comprising administering a β–lactamase inhibitor selected from the group consisting of:


,

,

, and salts thereof.

49. The method according to any one of claims 38, 42, 45, 46, 47, or 48, further comprising an antibiotic agent.

50. The method according to claim 49, wherein the antibiotic agent is a β-lactam antibiotic.